# What is a Watershed?

| Science Practice | Cross-Cutting Concept | Disciplinary Core Idea |
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| ***Developing and Using Models:*** (3-5, 6-8) Develop and/or use models to describe and/or predict phenomena. | ***Systems & System Models:*** (6-8) Models can be used to represent systems and their interactions—such as inputs, processes and outputs—and energy, matter, and information flows within systems. | ***Human Impacts on Earth Systems (ESS3.C):*** (3-5) Societal activities have had major effects on the land, ocean, atmosphere, and even outer space. Societal activities can also help protect Earth's resources and environments. (6-8) Human activities have altered the biosphere, sometimes damaging it, although changes to environments can have different impacts for different living things. Activities and technologies can be engineered to reduce people's impacts on Earth. ***Ecosystem Dynamics, Functioning, and Resilience (LS2.C)***: (3-5) When the environment changes some organisms survive and reproduce, some move to new locations, some move into the transformed environment, and some die. (6-8) Ecosystem characteristics vary over time. Disruptions to any part of an ecosystem can lead to shifts in all of its populations. The completeness or integrity of an ecosystem's biodiversity is often used as a measure of its health. |

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**Purpose:** Students will review what a watershed is, and that they live in the Puget Sound watershed.

**Materials:**
Puget Sound Watershed map
Wax paper
Washable Markers
Permanent Markers
Masking tape
11"x17" construction paper
Spray bottles (5)
Paper towels
Storm Drain Image
Mapping schoolyard legend
Graphing paper
clipboards

**Procedure:**
Prep before class:

1. Have squares of wax paper, construction paper and tape ready to distribute.
2. Hang up Puget Sound watershed map on classroom wall (if doing activity inside).
3. Prep clipboards by putting graph paper and mapping schoolyard legend in each one. Plan to have one clipboard for every student or one clipboard per pair.

Activity 1: Create wax paper watersheds (20 minutes)

1. (Instructor note: this activity can be done outside or inside. If inside, have the students clear off their desks completely as anything left out might get wet.)
2. Explain to the students that they are going to test what happens to water after it falls as rain. Give each student a square of wax paper and a sheet of construction paper. Have the students crumple up their wax paper sheet. Have them unfold the wax paper (but not completely!) and tape the edges to their construction paper.
3. Using washable markers, have the students color the tops of all their mountain ridges. They can then predict the direction the water will flow on their model using permanent markers. They can draw arrows to show the flow and circle and color in where they think the water will collect. It is helpful to use a different color permanent marker than the washable used for the ridges.
4. Pass out spray bottles (1 per table group) and let each student spray 3-4 times on their model before passing it to the next student. Have paper towels available for cleanup if needed.
5. Where did the water flow? Did you have any streams or rivers on your model? Did the water all flow to one low spot or did you have multiple collection spots? Were your predictions correct?
6. Refer to the Puget Sound watershed map. There are over 10,000 rivers that all flow into Puget Sound and almost 4 million people that also live here. Pollution ends up moving through the area with the water.

Activity 2: Review watershed basics. (5 minutes)

1. Have all the students come back together to discuss their watersheds. Did the water ever flow uphill? (No!)
2. When water falls as rain, where does it end up? (It runs over the land where it falls, into nearby bodies of water, and then eventually, in the ocean).
3. Did they have one puddle of water in their model or were there several? Explain to the students that they created one or more watersheds with their models. A watershed is all of the land that drains water into a specific body of water. Watersheds are named after the body of water into which they drain.
4. Another way to think about watersheds is to have students make a model of a watershed using their hands. Explain that the thumb edge represents mountains and the lines on their hand are streams.
5. Point to the Puget Sound Watershed map (or hold up if working outside). Where are we located on this map? Do a lot of people live in the Puget Sound watershed? Yes! Think back to when we added the pollution to our watersheds. Do you think pollution is a problem in this area? Hold up a picture of the storm drain and ask the students if they've seen these before. What are they? Where does the water go when it enters the storm drain? Water flowing into storm drains is not treated before it ends up directly into our rivers and streams. We are going to now go outside in the school yard and look at where water goes when it rains.

Activity 3: Mapping the schoolyard (30 minutes) *Adapted from Drain Rangers*

1. Now that everyone knows how the water and pollution flows in a watershed, let's take some time today mapping out how water flows near our school and how pollution may get into our local watershed.
2. Hold up the map legend and describe the different items.
    a. Rain gardens – specific garden areas that have been planted to slow the flow of stormwater
    b. Plantings – areas such as flower beds, grassy lawns, or bushes
    c. Tree
    d. Mulch – mulch only, no plants



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   e. Retention Pond/Bioswale - **Bioswales** are landscape elements designed to concentrate or remove silt and pollution from surface runoff water. They consist of a swaled drainage course with gently sloped sides (less than 6%) and filled with vegetation, compost and/or riprap.
   f. Green Roof – Plantings on the roofs of buildings
   g. Storm drain
   h. Storm pipe – Pipe directing stormwater
   i. Downspout splash – Splash pad at the bottom of a downspout
   j. Rain barrel/Cistern
   k. Pervious Concrete/Asphalt – Concrete or asphalt that allows water to soak through
   l. Curb cut – Section of curb that lowers to the street level.
3. Pass out the clipboards/graphing paper and walk outside with the students to map their school yard. Have them use the symbols on the map legend to show how water moves around their school yard.
4. Walk around to help students/pairs. Have them start by mapping out where the street/parking lot is first, followed by the school building. Then they can add in the grass and other areas. Direct the students on trying to find any storm drains.
5. With 5-7 minutes remaining, call the students back together. Ask them to share how many storm drains they found in their school yard. Was there more grass/mulch or more street/sidewalk? How will the water flow differently on those two areas? If there is pollution in the parking lot, where will it go?
6. Wrap up by prepping the students for the upcoming field trip (what to wear, etc.).



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